

AMENDMENTS TO THE CLAIMS

1-24. (Canceled).

25. (Currently amended) A fine filtering apparatus for removing fine particles from water, the device comprising:

- a. an elongated housing forming a main body and having an impervious wall enclosing an interior cavity that extends through the housing;
- b. a plurality of flexible fibers extending within the cavity for contacting flowing water and removing fine particles from the water without separating a permeate from the water;
- c. the housing including a pair of opposed end portions wherein disposed adjacent a first end portion is a water inlet for receiving a stream of water, the inlet including an annular water guide jacket extending around the first end portion of the housing and being in fluid communication with the cavity for distributing the water within the cavity;
- d. a header jacket disposed extending around a second end portion of the housing ~~adjaceant an opposite second end portion of the housing;~~
- e. the header jacket including a clarified water outlet for discharging a clarified water from the cavity;
- f. the header jacket also including a waste outlet for discharging a concentrated waste from the cavity;
- g. an air inlet for directing air into the cavity such that the air may contact the fibers and clean some of the fine particles from the fibers;

- h. a density control plate having an annular shape and disposed within the housing below the water guide jacket for increasing a density of the fibers below the water guide jacket and for generally inhibiting the water from flowing downwardly in a direction toward the air inlet;
- i. in one mode of operation of the fine filtering apparatus, the water is directed through the cavity and some of the fine particles are removed from the water producing the clarified water that is discharged from the cavity via the clarified water outlet; and
- j. in another mode of operation of the fine filtering apparatus, both the air and the water are directed through the cavity and some of the fine particles are cleaned from the fibers producing the concentrated waste that is discharged from the cavity through the waste outlet.

26. (Previously Presented) The fine filtering apparatus of claim 25 wherein first ends of the fibers are secured to a media fixing plate disposed near a first end of the housing and wherein second ends of the fibers are disposed near a second end of the housing, the second ends of the fibers being unattached and free to move about in the cavity as water passes through the cavity; and wherein the fibers are non-tubular and non-membranous.

27. (Previously Presented) The fine filtering apparatus of claim 25 wherein one or more of the fibers is formed from a material selected from a group including polyamide, polyester, and polypropylene.

28. (Previously presented) The fine filtering apparatus of claim 26 wherein the density control plate increases the density of fibers in an area of the cavity between the water guide jacket and the media fixing plate and wherein the increased density of the fibers generally inhibits the water from flowing in a direction from the water guide jacket towards the media fixing plate, the density control plate comprising an annular shaped plate is disposed within the housing between the media fixing plate and the annular water guide jacket and having an opening through which the fibers extend, wherein the annular plate constrains the fibers to the opening thereof, thereby increasing the density of the fibers in the opening of the annular plate and generally inhibiting the water from flowing from the water guide jacket to the media fixing plate.

29. (Previously presented) The fine filtering apparatus of claim 25 including one or more air supply holes disposed in a member within the housing for conducting air into the cavity and dispersing air within the cavity and about the fibers.

30. (Previously presented) The fine filtering apparatus of claim 29 wherein the one or more air supply holes form an array of air supply holes disposed in a media fixing plate, the array of air supply holes being disposed adjacent ends of the fibers that are secured in the plate and which act to disperse the air about the fibers.

31. (Previously Presented) The fine filtering apparatus of claim 25 wherein an array of openings is disposed in a circumferential band around the outer wall of the housing, the array of openings in the outer wall being aligned with the annular water guide jacket to conduct the water into the cavity and to distribute the water within the cavity.

32. (Previously Presented) The fine filtering apparatus of claim 25 including a porous chamber in fluid communication with the clarified water outlet, the chamber disposed in the second end portion of the housing and projecting in among the fibers to receive the clarified water from the cavity.

33. (Previously Presented) The fine filtering apparatus of claim 32 wherein a volume of the porous chamber is about 10% to about 50% of a volume of the cavity.

34. (Previously presented) A fine filtering apparatus for removing fine particles from water directed from a water source, the device comprising:

- a. an elongated housing forming a main body and having an impervious outer wall comprising a substantial portion of the main body;
- b. an interior cavity extending through the housing and being substantially enclosed within the outer wall;
- c. a plurality of flexible fibers extending within the cavity for contacting flowing water and removing fine particles from the water;
- d. first and second end portions of the housing each disposed adjacent opposite first and second ends of the housing;
- e. a water inlet disposed on the first end portion for directing the water into the cavity;
- f. the second end portion of the housing, including a clarified water outlet for discharging clarified water from the cavity and a waste outlet for discharging a concentrated waste from the cavity;

- g. an air inlet disposed adjacent the first end portion for directing air into the cavity for contacting the fibers and for cleaning some of the fine particles from the fibers;
- h. a density control plate for increasing the density of the fibers in an area of the cavity between the water inlet and the air inlet and wherein the increased density of the fibers generally inhibits the water from flowing in a direction from the water inlet towards the air inlet, the density control plate comprising an annular plate disposed within the housing between the water inlet and the air inlet and having an opening through which the fibers extend, wherein the annular plate constrains the fibers to the opening thereof, thereby increasing the density of the fibers in the opening of the annular plate and generally inhibiting the flow of water from the water inlet, through the opening of the annular plate, to the air inlet;
- i. in one mode of operation of the fine filtering apparatus, the water is directed through the cavity and some of the fine particles are removed from the water, producing the clarified water that is discharged via the clarified water outlet; and
- j. in another mode of operation of the fine filtering apparatus, both the air and the water are directed through the cavity and some of the fine particles are cleaned from the fibers producing the concentrated waste that is discharged via the waste outlet.

35. (Previously Presented) The fine filtering apparatus of claim 34 wherein first ends of the fibers are secured to a media fixing plate disposed near the first end of the housing and wherein second ends of the fibers are disposed near the second end of the housing, and are unattached and free to move about; and wherein the fibers are non-tubular and non-membranous.

36. (Previously presented) The fine filtering apparatus of claim 34 wherein the density control plate is disposed within the housing between a media fixing plate and the water inlet, the density control plate increasing a density of fibers between the media fixing plate and the water inlet.

37. (Previously presented) The fine filtering apparatus of claim 34 including on or more air supply holes in a member disposed within the housing for conducting the air into the cavity and dispersing the air about the fibers.

38. (Previously presented) The fine filtering apparatus of claim 34 including an array of air supply holes in a media fixing plate disposed within the housing, the plate having ends of the fibers secured thereto, the array of openings disposed adjacent the ends of the fibers for conducting the air into the cavity and dispersing the air about the fibers.

39. (Previously Presented) The fine filtering apparatus of claim 34 wherein an array of openings is disposed in a circumferential band around the outer wall of the housing, the array of openings being aligned with the water inlet which includes an annular water guide jacket to conduct the water into the cavity and to distribute the water within the cavity.

40. (Previously Presented) The fine filtering apparatus of claim 34 including a chamber having an array of openings in an outer wall thereof, the chamber in fluid communication with the clarified water outlet, and the chamber disposed in the second end portion of the housing and projecting in among the fibers for receiving the clarified water.

41. (Currently amended) A method of treating water having fine particles therein with a device having a treatment cavity, an air inlet and a water guide jacket comprising a water inlet disposed on one portion of the device, and a clarified water outlet and a concentrated waste outlet disposed on another portion of the device, the method including:

- a. closing the concentrated waste outlet and opening the clarified water outlet;
- b. directing the water into the water inlet in the water guide jacket and through the treatment cavity;
- c. increasing the density of a plurality of flexible fibers extending within in the treatment cavity in an area below the water guide jacket using a density control plate to inhibit the water from flowing downwardly in a direction toward the air inlet;
- d. [[c.]] as the water is passed through the treatment cavity, flowing the water adjacent [[a]] the plurality of flexible fibers extending within the treatment cavity and removing fine particles from the water without separating a permeate from the water;
- e.[[d.]] discharging the clarified water out the clarified water outlet;
- f.[[e.]] closing the clarified water outlet and opening the concentrated waste outlet;
- g.[[f.]] injecting air from the air inlet into the treatment cavity through openings disposed in a media fixing plate to which the fibers are attached and mixing the air with the water having the fine particles to form an air-water mixture;

h.([g.]) passing the air-water mixture through the treatment cavity and contacting the fibers and dislodging the fine particles captured on the fibers, producing a concentrated waste including the air -water mixture and the dislodged fine particles; and

i.([h.]) discharging the concentrated waste through the concentrated waste outlet.

42. (Previously Presented) The method of claim 41 wherein respective fibers include opposed ends, and wherein one end of each fiber is fixed while the other end is unattached and free to move about as the water or air-water mixture passes through the treatment cavity; and wherein the fibers are non-tubular and non-membranous.

43. (Currently amended) The method of claim 41 wherein increasing the density includes including extending the density control plate an annular device around a portion of the fibers and generally compressing the fibers in an area of the treatment cavity.

44. (Previously presented) The method of claim 41 directing the air into the cavity through one or more air supply holes disposed adjacent the fibers.

45. (Canceled)

46. (Previously Presented) The method of claim 41 wherein directing the water into the treatment cavity includes directing the water through an array of openings in a circumferential band extending around an outer wall that surrounds the treatment cavity and distributing the water within the cavity.

47. (Previously Presented) The method of claim 41 including directing the clarified water into a porous chamber in fluid communication with the clarified water outlet, the chamber disposed in the treatment cavity and projecting in among the fibers when the water or air -water mixture is passing through the treatment cavity.

48. (Previously Presented) The method of claim 41 including generating turbulence in the treatment cavity by contacting the water with the fibers.

49. (Previously Presented) The method of claim 41 wherein the treatment cavity is formed by an elongated housing and wherein the air inlet and water inlet are disposed adjacent one end portion of the housing and the clarified water outlet and concentrated waste outlet are disposed adjacent an opposite end portion of the housing, and wherein the housing is cylindrical and the fibers extend generally longitudinally through the cavity as the water passes in contact with the fibers.

50. (Previously presented) The method of claim 41 wherein the clarified water is discharged out the clarified water outlet while the concentrated waste outlet is closed and wherein the concentrated waste is discharged through the concentrated waste outlet while the clarified water outlet is closed.

51. (Canceled)

52. (Previously presented) The method of claim 41 including extending the flexible fibers through a generally central opening formed in an annular plate that is disposed between the water inlet and the air let such that the flexible fibers are constrained by the

opening in the annular plate and the density of the flexible fibers in the opening of the annular plate generally inhibits the flow of water from the water inlet to the air inlet.

53. (Previously presented) The fine filtering apparatus of claim 35 wherein the flexible fibers remove fine particles from the water without separating a permeate from the water.